MARINE REVIEW.

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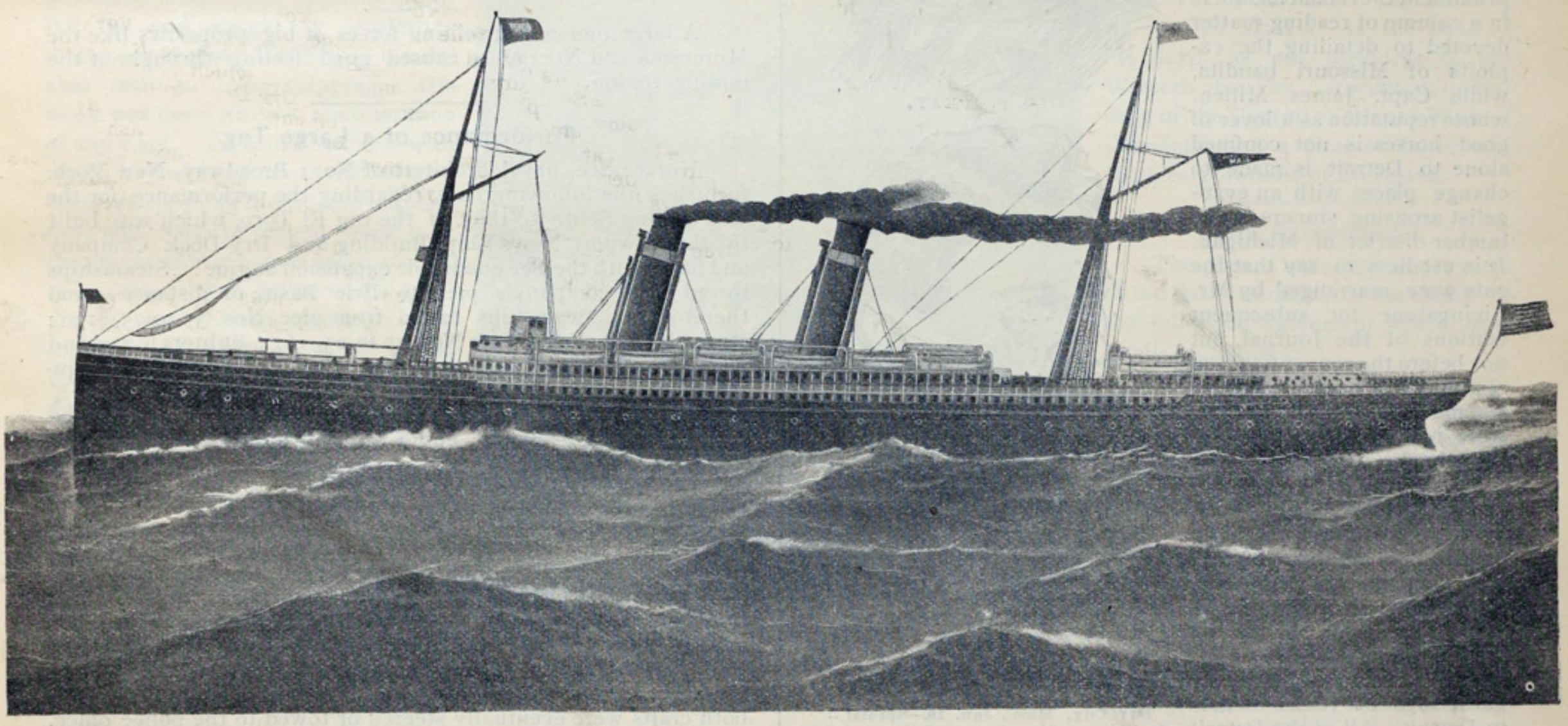
The St. Louis, First of the American Line Ships.

Although the William Cramp & Sons Ship and Engine Building Company has as yet given out no extended description of the two new American line ships being built at their works in Philadelphia, we are enabled to present on this page an engraving of the first of the boats, the St. Louis, on which work is now well advanced. The engraving is, of course, made from a painting, which represents the boat at sea, and which was made from the best possible information obtainable at this time. The St. Louis and her sistership, the St. Paul, will be the largest merchant vessels ever constructed in America. They are the first steamers built in this country for the transatlantic trade since 1872 73, when the Ohio, Indiana, Illinois, and Pennsylvania, the first four ships of what is practically the same line, were built.

A paper read by one of the Messrs. Cramp at the recent inaugural meeting of the Society of Naval Architects and Marine Engineers in New York gives the dimensions of the St. Louis as 534 feet long, 63 feet wide and 42 feet deep. Her tonnage will be about 11,000, gross register, and the power will be in twin-screws actuated by two quadruple expansion engines, which, with steam at 200 pounds pressure, will develop about 20,000 collective indicated horse power. The passenger accommodations are capable of providing for about 320 first class and 175 second class passengers, as well as 900 immigrants. There will also be space for about 1,500 tons of freight. Several descriptions of cabins, state rooms, etc., have been printed, but all are in advance of any definite information from the builders or owners, and are accordingly speculative. Among the features of this ship that represent advance practice, the adoption of quadruple expansion engines is of the highest importance, as the St. Louis will be the first transatlantic steamer to be so equipped. She will have only two masts and two smoke stacks, instead of the three masts and three stacks in the Paris and New York. She also differs from those steamers in having as straight stem instead of a clipper shaped bow and bowsprit. In outward or shell construction the St. Louis will be like the Majestic and Teutonic, as all plates will be lapped, while inwardly the form of construction will be similar to that of the New York and Paris. Another feature of construction is spoken of in Mr. Cramp's paper, referred to above. The outboard shaft bearings are supported by building out the hull in a horizontal webb to a steel frame having both bosses cast in one piece, weighing 68,000 pounds. The keel slopes up so that the shoe meets the boss frame at the after end, the after deadwood being cut away.

These vessels have been specially arranged so as to be readily and quickly convertible into armed cruisers, carrying eight 6-inch rapid-firing guns. The conditions of the mail contract between the government and the ship owners, the International Navigation Company, place at the disposal of the navy these great steamers for commerce destroyers. With the three other merchant ships of this kind that are to follow, as soon as the St. Louis and St. Paul are in commission long enough to dispose of questions now undetermined, the U. S. Navy will be practically reinforced by $21,000,000 worth of ships, and that not only without cost of building, but also without the expense of maintenance and commission in time of peace.



NEW AMERICAN LINE STEAMER ST. LOUIS.

Calculations made at the navy department of the effect the plan prepared by the naval stability board of cutting the gun boats Machias and Castine in two and lengthening each 14 feet, in order to remove top heaviness, will have on the spead of these two vessels, show that the change will make a very slight difference. The horse power now required to give 8 knots speed per hour would give the vessels 7.65 knots at the increased length. At the horse power now required to drive the vessels 14.5 knots, the loss in speed at the increased length would be one-fourth of a knot.

Convention Matters.

A glance to the right at the column of sensational headlines mixed with portraits that are familiar in all parts of the lakes will give the few vessel owners who failed to attend the Lake Carriers meeting at Detroit last week an idea of one of the amusing occurances that have been talked of since the convention adjourned. But then, the absent few may have reason to congratulate themselves upon escaping the fate assigned to some members of the association at the hands of a "make-up" in the office of the Detroit Journal, owned by William Livingstone, jr., who is himself a prominent vessel owner. The reproduction shows how an accidental arrangement of cuts in one issue of the Journal placed the portraits of two prominent Cleveland members in a column of reading matter devoted to detailing the exploits of Missouri bandits, while Capt. James Millen, whose reputation as a lover of good horses is not confined alone to Detroit, is made to change places with an evangelist arousing sinners in the lumber district of Michigan. It is needless to say that the cuts were rearranged by Mr. Livingstone for subsequent editions of the Journal, but not before the convention proceedings had been brought to a stand-still by the wags, who were not slow in taking up the mistake.

The thanks of all association members are certainly due to Mr. William Livingstone, jr., and his son, W. A. Livingstone, for courtesies received at their hands on several occasions since it has become customary to hold gatherings of vessel owners in Detroit. All of the Detroit owners have, of course, shared in the entertainment of guests on such occasions, but it is not doing too much to specially note the efforts of the gentlemen named to make matters pleasant for the visitors. They made arrangements for the freedom of the Detroit Opera House to association members on Wednesday evening.

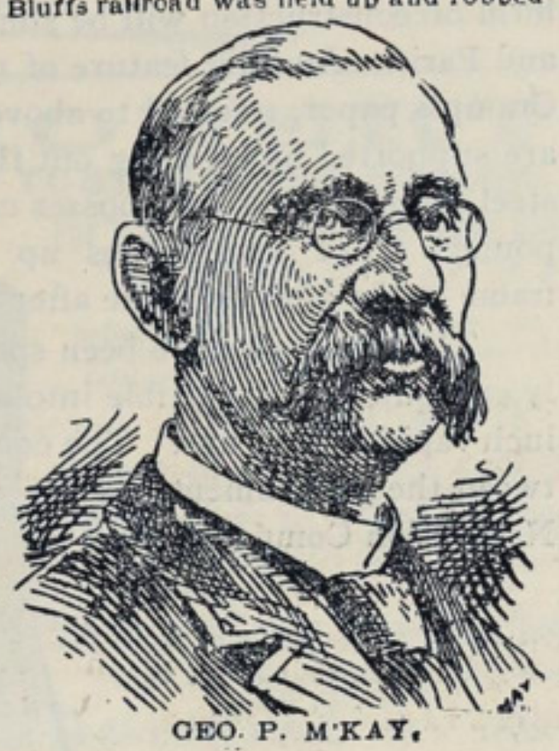
President James Corrigan is credited with having originated the plan of laying up 25 per cent. of the lake tonnage. It is certainly more practicable than any other scheme as yet proposed. None of the committees in the lake cities have as yet begun work on securing signatures.

ROBBED A TRAIN

Contents of the Express Car Safe Were Dumped into a Sack.

Another Hold Up at the Same Place on Sept. 25.

St. Joseph, Mo., Jan 18.—Train No. 3 on the Kansas, St. Joseph & Council Bluffs railroad was held up and robbed



GEO. P. M'KAY.

HARVEY D. GOULDER,

AROUSING SINNERS.

Bay City, Mich., Jan. 18.—Special.—The attendance at the revival meetings has become so large that one church has been found too small to

CAPT. JAMES W. MILLEN.

Iron Mining Matters.

Announcement is made by one of the officers of the Ashland Mining Company of a change in the management. E. A. Hayes, manager, and J. O. Hayes, treasurer, have resigned their respective positions and Mr. W. D. Rees of the Republic Iron Company, Cleveland, will, according to report, assume the duties of both offices. Whether this change will carry with it the sales agency of the company's ore is not as yet given out. There is said to be more ore in sight at this mine than ever before. Recent developments show ore higher in iron and lower in phosphorus than has ever been mined on the property.

At the annual meeting of the Aurora Mining Company in Milwaukee members of the old board of directors were re-elected as follows: Charles L. Colby, Edwin H. Abbot, Colgate Hoyt, Joseph L. Colby, Charles H. Ropes, L. H. Severance and W. J. Olcott. Although this company is controlled by capitalists who are also at the head of the Penokee and Gogebic Consolidated Mines, it is claimed that the failure of the latter corporation does not in any way affect the Aurora.

As proof of the statement made early in these columns, that little winter work would be done on the Missabe range on account of the expense attending open-pit mining in cold weather, it is found now that the only work of importance on the range is being conducted by the Minnesota company at its Canton and Iron King mines.

A large increase in mining forces at big properties like the Minnesota and Norrie has caused good feeling throughout the mining region.

Performance of a Large Tug.

Horace See, naval architect of No. 1 Broadway, New York, furnishes the following date, regarding the performance for the year ending Sept. 30, 1893, of the tug El Toro, which was built by the Newport News Ship Building and Dry Dock Company and fitted with the See quadruple expansion engine: Steamships towed from company's piers to Erie Basin, or distance equal thereto, 64; steamships towed from pier Nos. 37 to 25, 130; steamships docked at pier Nos. 37 to 25, 167; lighters towed and moored, 601; miles run without tow, 4,589; on fire duty, remaining time; days in commission, 349; coal consumed per day, 1¼ tons. The full pressure of steam was kept on the boiler for the entire twenty-four hours; boiler run four months without opening.

Couldn't be Pumped Out.

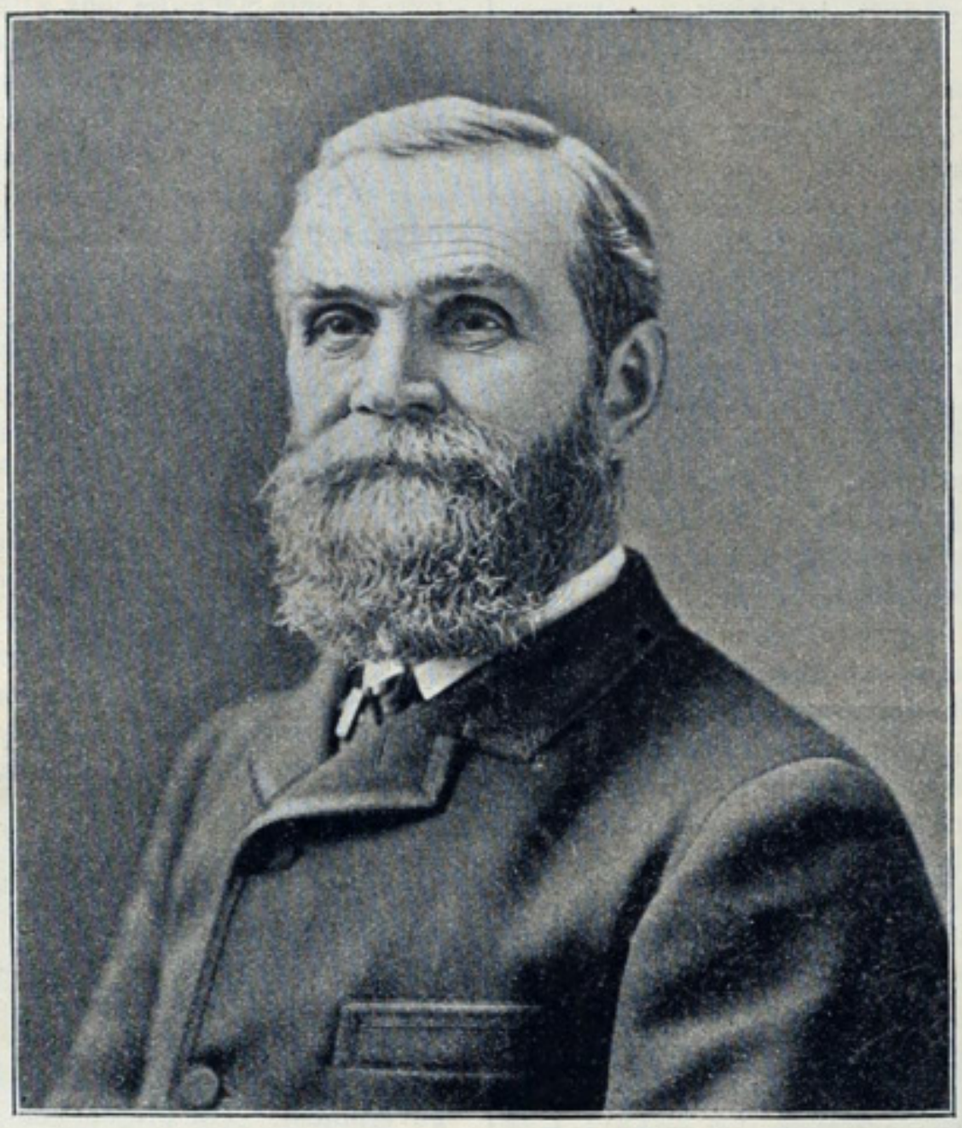
London Fairplay gives this amusing sketch: "Arriving recently in port after a long voyage not devoid of hardships, two A. B. mariners promply set about organizing a 'breeze' which they had faithfully promised themselves they would enjoy when once on shore. Fairly started on this tack it was not long before they were scudding before the wind with every bit of canvas spread. After the inevitable series of groundings and collisions both crafts were eventually steered or towed to the police office. One of them being less of a wreck than the other, was allowed his liberty, while the other who was completely waterlogged, was put under hatches. Next day the liberated tar was asked by his shipmates why he had not bailed out his chum. 'Baled him out!' exclaimed honest Jack, 'why, he couldn't even have been pumped out!'"

Bills of Lading in 1836.

While in Detroit, Treasurer McKay was presented with a valuable relic by Capt. William Thorne. It is a book, well preserved, of bills of lading covering mainly cargoes shipped by Gabriel Franchere from Sault Ste. Marie to Detroit during the season of 1836. Among the vessels and masters named are the following: Schooner Marshall Ney, Capt. John Nelson; schooner John Jacob Astor, Capt. C. C. Stanard; brig Ramsay Crooks, Capt. Benj. A. Stanard; schooner General Warner, Capt. A. St. Bernard; schooner E. Rancroft, Capt. J. C. Benjamin; schooner General Harrison, Capt. E. B. Ward; schooner Post Boy, Capt. John H. Earl; sloop Maid of the Mist, Capt. Williams; steamboat Constellation, Capt. R. L. Robertson; schooner Florida, Capt. Lyman Beckley; schooner William Brewster, Capt. John Wood. Capt. Thorne obtained the book some time ago from an old resident at the "Sault."

The Late Hon. Geo. H. Ely.

It was certainly strange that Hon. George H. Ely of Cleveland should meet death suddenly in Washington on the very day on which a Democratic congress took up discussion of the iron ore clause of the Wilson tariff bill, with the evident intention of wiping out all vestige of protection for that commodity. Stranger still is the fact that he was at the capital on a mission connected with that special feature of the bill. Mr. Ely was known throughout the country as the foremost representative of the iron ore business of Lake Superior and the vessel interests connected with the transportation of iron ore on the lakes. Although he had not been interested to a large extent, from a money standpoint, in either iron mines or vessels on the lakes for a number of years past, the wealth he had earned in the development of the Minnesota range, one of the great tracts of mineral lands in the Lake Superior region, had enabled him to give time and labor to the study and discussion of all questions affecting the industry, which he looked upon with great pride. Probably no man in the United States was better posted than he in matters pertaining to the iron business. Wealth and influence, scholarly and gentlemanly qualifications, a liking for statistical work and the ability to peculiarly adapt such labor to securing the end sought in legislative matters, had made Mr. Ely an invaluable man to lake shipping. His work was done without remuneration of any kind. Pride in a business with which he had been connected almost from its beginning caused him to spend days and weeks of patient work over the preparation of papers and speeches, to be presented or delivered to commercial conventions, committees of congress and meetings of all kinds. His principal labors in connection with lake improvements will soon bear fruit in the completion of the new St. Mary's Falls canal lock, Hay lake channel and the 20-foot channel, which involve expenditures approximating ten millions. He was especially devoted to these works, and was often heard to express a desire to see them followed, before life's labors were done with him, by the beginning of appropriations for a ship canal in American territory from the lakes to the Atlantic seaboard.



George H. Ely

Mr. Ely began business in Cleveland in 1863 with H. B. Tuttle, but had been interested in the Minnesota iron mining business for several years previous to that time. Born at Rochester, N. Y., a son of Elisha Ely, who was one of the founders of that city, he prepared himself for college, and in 1846 entered Williams college, whence he was graduated in 1848. A few years later his attention was turned to the Lake Superior mining district, and in company with his brothers, Samuel P. Ely and Heman B. Ely, he constructed the Iron Mountain Railroad, which is now a part of the Duluth, South Shore & Atlantic. Mr. Heman B. Ely died while the road was under way. Both Mr. Geo. H. Ely and Mr. Samuel P. Ely had already invested heavily in iron ore lands. The partnership with Mr. H. B. Tuttle in Cleveland continued until 1878, when Mr. Tuttle died and the title of the company was changed to Geo. H. & S. P. Ely. A few years later the iron mining interests in the Minnesota range were sold to the corporation now controlling them, the Minnesota Iron Company, but both of the Messrs. Ely retained stock interests of moderate value in other Lake Superior properties.

Shortly after the sale of the Minnesota mines, the Messrs. Ely took up, with New York and Philadelphia capitalists, the development of valuable mineral lands in Cuba. Mr. S. P. Ely has had most to do with this enterprise, and has spent a very large part of his time in Cuba looking after the building of a railway, docks, etc. Mr. Geo. H. Ely has lived just long enough to see these Cuban mines in readiness to send ore to market. He repeatedly declared that his Cuban interests would have no bearing upon his ideas regarding protection for the iron ore business of the United States, and death came to him while standing by this conviction in seeking a retention of the duty on ore at a time when removal of the duty would seem to benefit him to the disadvantage of his former associates in the Lake Superior region. Mr. Ely served two terms in the upper house of the Ohio legislature and was at the head of that body. He was many times urged to make an active canvass for election to congress, on account of his special fitness for the position, but he was not a politician. He was the representative of Cleveland commercial interests in national gatherings of business men on many occasions during the past ten or twelve years, and two years ago attended a congress on inland navigation in France as one of the representatives of associated engineers of the United States. At the time of his death he was president of the Western Iron Ore Association, president of the Central National Bank of Cleveland and a director in several large corporations of Cleveland.

The Agreement.

The plan of laying up 25 per cent. of the lake tonnage, is embodied in the following agreement which now awaits signatures:

"The following agreement is conditioned upon its terms being assented to in writing by 90 per cent. of the Lake Carriers' tonnage engaged in the carrying of iron ore, coal and grain: Subject to the foregoing we, each agreeing for and hereby intending to bind and obligate all such vessels owned, managed or controlled by us respectively, do agree that during the season of 1894, 25 per cent. of such tonnage shall be out of commission. This shall be accomplished as follows: Where physical division can be made 25 per cent. of the tonnage shall be laid up continuously during the entire season. In case of single vessels such vessels shall be laid up one full quarter of the season and at least one-half of the time shall be at the beginning of the season. In case of several vessels under one management, but of diversified ownership, they may be pooled or treated each as a single vessel, but in either case 25 per cent. shall be laid up during the entire season, or each vessel shall be laid up one quarter of the season. Where physical division can not be made so as to keep laid up continuously 25 per cent., such division shall be made so far as feasible and any overplus shall be treated as single vessels. In every case, except where there is a physical division keeping laid up 25 per cent. of tonnage continuously for the whole season, sufficient tonnage shall be held laid up at the beginning of the season to cover at the beginning at least one-half of the required 25 per cent. It is understood that vessels holding grain cargoes for storage and for spring delivery shall have the right to deliver their grain cargoes before being required to lay up."

Important Ship Canals.*

RELATIONS OF OUR GREAT INLAND WANERWAY TO THE PROPOSED NICARAGUA CANAL.

I am glad of the opportunity of speaking to the gentlemen of this association upon this subject, because you have used the most important ship canal with locks in the world; because you are the only body of men who are so familiar with the conditions, facts and results of our inland waterway that they can be used in your presence by simple reference without the necessity for proof; because some of you have already extended your enterprises to the ocean, and others are contemplating the same; and beeause I believe that when the isthmus is crossed by a waterway you will be the first to foresee and develop the great home business that will be done between the Atlantic and Pacific sides of our continent.

I spoke of the St. Mary's Falls canal as the most important ship canal with locks. The Manchester ship canal, which is just completed, is not for through transit, but is in the nature of a harbor extension. It is, however, a grand proof of the possibilities of locks in ship canals. From the first there have been but two continents that could be severed from adjacent land by artificial waterways. France has conquered at Suez and made an island of Africa. And this has added more to her fame and prestige than anything she has done since she sent LaFayette to us. She has attempted the other at Panama, but with her fatal capriciousness has made a failure not unmixed with ign miny. Two routes will be considered—Panama, because it has been attempted by the French, and Nicaragua, because it is being attempted by Americans. The isthmus has been examined in every part. It has been found that a canal could be built, not in one place alone, but in many different places. The question asked of the engineers for the last fifty years is not—Is there a possible place? But, of the many places, which is the most desirable? At Panama, the isthmus is the narrowest, but it is not the lowest. At Nicaragua, the land is the lowest of any part between the Straits of Bering and Magellan, but the isthmus is four times wider here than at Panama.

At Panama, the length of the canal is 41 miles, and the highest land to be crossed 295 feet. At Nicaragua, the length of the canal is 169 miles, and the highest land necessarily crossed 153 feet—less than some of our tallest pines. Here the isthmus is divided into two parts by Lake Nicaragua. This lake is 110 miles long and 40 miles wide. It is therefore about as large as that part of Lake Erie lying to the eastward of Ashtabula. Its surface is 110 feet above sea level. On account of its size, it is not subject to greater fluctuations than Lake Erie. If a strait were opened to it from the ocean, so as to lower it down to sea level, it would still be 130 feet deep. Its bed is not simply a mountain valley, but is rather an oceanic depression. On the Pacific side the lake approaches within 12 miles of the sea. The intervening land rises 43 feet above the surface of the lake. In order to permit ships to pass from the Pacific up into Lake Nicaragua, it is only necessary to build six such locks as those at St. Mary's falls, and twelve miles of canal, in which the deepest cutting would be only 43 feet more than the depth of the canal. On the north side the lake is connected with the Atlantic by the San Juan river, which is 120 miles long. In its upper half it is about 10 feet deep and from 300 to 1,200 feet wide. In order to permit ships to pass from the Atlantic ocean to Lake Nicaragua it would only be necessary to build six locks similar to those at St. Mary's falls and construct a canal through the valley of the San Juan river 120 miles long, in which there would be no cutting above the level of the canal. The engineers of the Nicaragua Canal Company show that even this is not necessary, since the water can be turned by a dam into another valley, thus making it a navigable arm of the lake; so that about 100 miles of the route will need no artificial preparation. About 40 miles more will only need to be deepened by dredging, leaving 26 miles only of canal proper through open cuts. The same company has made an estimate of quantities of work of various kinds necessary to complete the canal. These quantities can be expressed in units familiur to us by the statement that the Nicaragua canal requires about twelve times as much lock building and twenty-five times as much canal excavation as the St. Mary's Falls canal. There are also two harbors to be built, one at either end of the canal.

The engineering difficulties to be overcome in this particular route are the building of locks and dams, the excavating and dredging of a canal, and the construction of harbors—no single part presenting difficulties which have not been repeatedly overcome elsewhere. It is the aggregate alone which makes the undertaking formidable. Government aid for this project has been recommended by Lincoln and all of the presidents since. The cost of this particular route has been estimated by the company's engineer at $65,000,000. For this estimate the price of labor has been made the same as for the work already done by the company. It should, however, be remembered that this is mostly native labor and has not yet been employed in very large quantities. If much work should be done it is possible and probable that skilled labor would be required, which it would be necessary to import, making the cost greater. A second estimate has been made by a commission of engineers. The commission was formed at the instance of the Nicaragua company. Their estimate was $87,000,000. One member of this commission was Charles T. Harvey, who was the engineer and managing man for the company that built the first, or state, locks at St. Mary's falls. If the amounts of the different kinds of work as given by the Nicaragua company be taken as a basis and multiplied by the prices paid for similar work at St. Mary's falls a total of $67,000,000 is obtained. It is not probable that labor and material in large quantities can be obtained as cheaply in Nicaragua as here. If they should cost twice as much, then the Nicaragua canal would cost $134,000,000. The freight which passed St. Mary's Falls canal last season was worth this and eleven and a half millions more. If the cost of labor and material should prove to be three times as great in Nicaragua as here, and this is not impossible, then the canal would cost $201,000,000.

The business through this canal will have very little relation to the business which is now moving over longer routes. This is very aptly illustrated by the business of the St. Mary's Falls canal. Take the item of irom ore, of which last season you carried 4,006,000 tons through the canal. This could not have been carried by rail for less than $5 a ton, which is more than the ore is worth after transportation. The same is true of the 3,000,000 tons of coal which you carried to the west, If there had been no water route this business would not have been done at all. Then it is plain that tha water route to Lake Superior created for itself 7,000,000 tons of business last year. The Nicaragua canal is similarly situated. Let us examine the possibilities of its creating a business in low priced freights which are not now moving at all. The gentlemen of this association have carried freight to and from Lake Superior for the last three seasons for about one and one-third mill per mile-ton, and this over a route 800 miles long with 100 miles of river and canal and lock. It is safe to assume that over a long ocean route you would carry freight for one mill per mile-ton, or $1 for a thousand miles, and this is the average ocean rate commonly used by statisticians. The distance from Portland, Oregon, to New York, by way of the proposed Nicaragua canal, is 5,400 miles. Freight over this route would therefore be $5.40 per ton, and if we add $1 for tolls through the canals it would be $6.40. A ton of potatoes is 33⅓ bushels, and therefore the freight of one bushel of potatoes would be 19 cents. There have been times within the last five years when the price of potatoes was 60 cents more in New York than in Portland. This, however, is an unimportant commodity and is only mentioned to show the surprising directions in which business may be developed by cheap transportation. If a staple commodity, such as lumber, be taken, we find that 1,000 feet, B. M., of seasoned fir or redwood weighs about 1½ tons; therefore its freight, including tolls, from Portland to New York would be $9.60 per thousand, B.M., which is less than half the present difference in price for high grades. It is true that the present high priced freights which are moving over routes that would be shortened by the canal, will be attracted through it, but this portion will be, I believe, comparatively unimportant. The great business is not now in existence, but, as at St. Mary's Falls canal, it will be created by the canal itself.

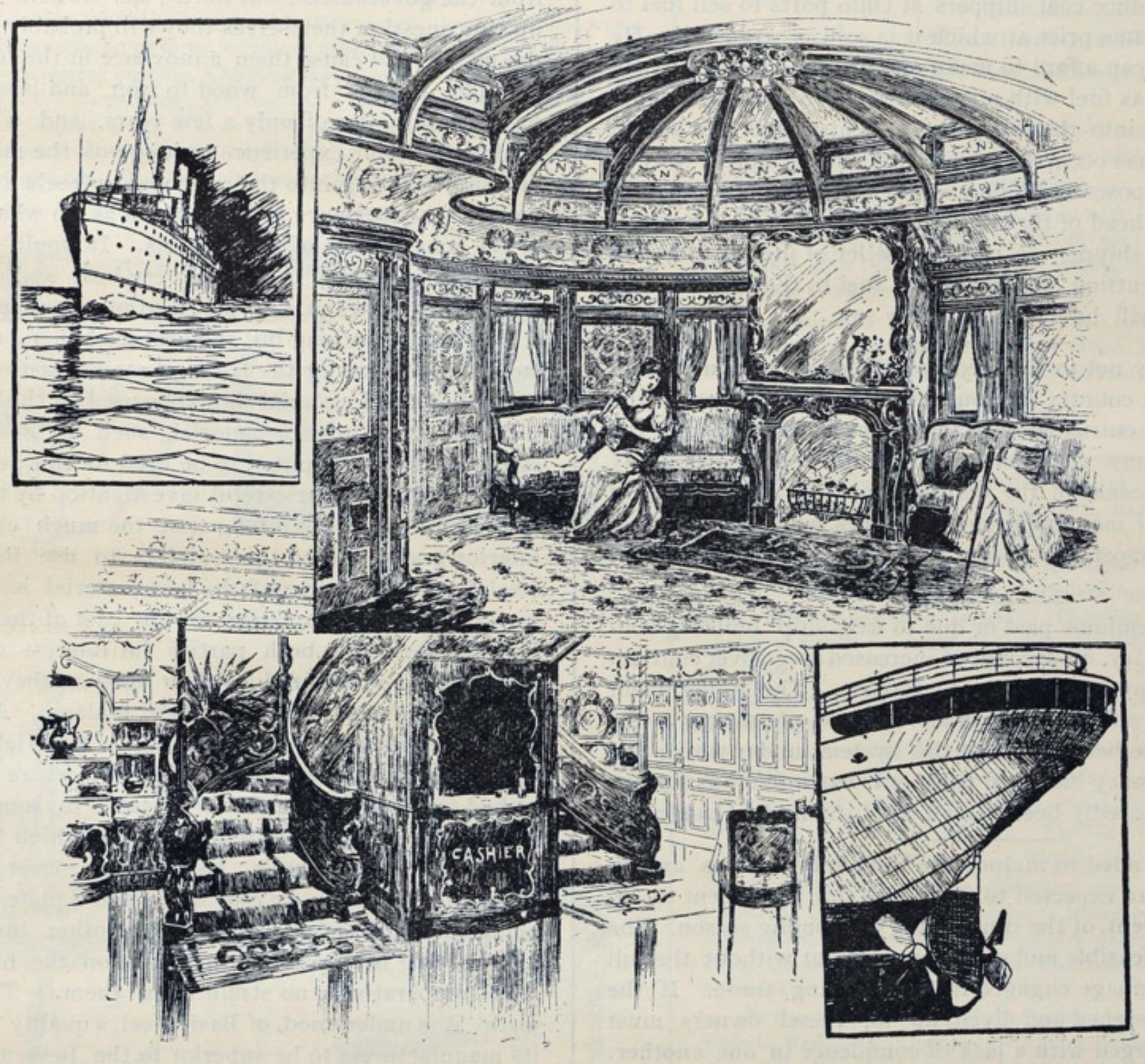
Why is this canal not built? Admiral Acmen, who has devoted many years to this enterprise, has shown in a popular article how its bright prospects were temporarily eclipsed by our civil war. After the war it was revived. A second time attention was drawn away from it by the Eads ship railway project. After this the French enterprise at Panama obscured it for a time. It now seems to be again fairly up for consideration and without a rival. The present canal company has obtained from the government of Nicaragua the necessary concessions, but this government is too small to offer any assurance of permanency. The first requisite is the support of some strong government. The present company has asked the United States to endorse its bonds, believing that this would insure protection to the enterprise. I believe they have also proposed to sell to the United States their work and concessions. Tney have expended some millions in surveys, harbor improvements, etc. I believe that all Americans would be glad to have our government undertake this project if they could be assured that it would be well and safely carried out. I heard a former secretary of state say that he should be glad to have our country build this canal, but building meant defending, and this required a navy, and though our navy was growing it was not yet large enough. Some say that they would like to see our government undertake the work, only they feared a repetition of the Pacific railroad scandal. Others have pointed to the disgraceful and tragical ending of the Panama enterprise and have insisted that we must not invite such a calamity. A wealthy politician has said that the scheme was all right, but that he did not want to tap the hundred millions until his party was in power. I heard a man high in the offices of this government say in a hushed voice that before our country entered upon this enterprise we should remember that England has more than 700 ships in her navy. Objections of this nature are all that I have heard. I have never heard that the scheme was impracticable or doubtful; that the money could not be raised; that in the end it would not be profitable, or that it would be injurious to any class or individual; or any other objections of this kind.

If it is true that our government could not do this work without corruption and disgrace, and that if we attempted it some strong nation would punish us, why even then, I believe that it would be better for us to try it and take our punishment with such manliness as we may have; and then try and profit by the self knowledge which the experience would bring us. But if this is a peaceful and profitable commercial enterprise; if it would be honorable to undertake it and creditable to complete it; if our country has the ability to design, and the wealth, the skill, the industry and honesty to accomplish it, and the strength, the pride and the courage to maintain it, I believe that the gentlemen of this association will say "let us try it."

*Paper read before the third annual meeting of the Lake Carriers' Association by Gen. E. S. Wheeler, superintendent of the St. Mary's Falls canal.

Interior of the Northern Line Passenger Ships.

Work on the interior of the Northern line passenger steamer North West at the ship yard of the Globe Iron Works Company, Cleveland, has now progressed far enough to admit of an idea being formed of the elegant cabin arrangements that are to be a feature in the ships of this new line. The decorators have prepared some drawings of parts of the interior of the first ship. Two of these, representing the main stair and a cove in the main saloon, were recently engraved by the publishers of the Buffalo Illustrated Sunday Express, and are here reproduced in connection with small bow and stern views of the boat. Other drawings of attractive parts of the cabins are also being prepared and will probably be illustrated later on.



NORTHERN LINE PASSENGER SHIP NORTH WEST—A COLLECTION OF VIEWS.

Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store at the principal points of accumulation on the lakes on Jan. 20, 1894:

	Wheat, bu.	Corn, bu.
Chicago	20,280,000	4,543,000
Duluth	9,878,000	17,000
Milwaukee	891,000	.....
Detroit	1,720,000	44,000
Toledo	2,785,000	673,000
Buffalo	2,485,000	586,000
Total	38,039,000	5,863,000

At the points named there is a net increase for the week of 351,000 bushels of wheat and 826,000 bushels of corn.

A very attractive little triple expansion engine is undergoing some alterations in the machine shop of the Frontier Iron Works, Detroit. It is the engine of J. S. Newberry's yacht Dawn of Detroit, built by the Herreshoffs of Bristol, R. I. Joy vale gear is being fitted by the Frontier company.

In General.

Despite two or three mishaps to shipping, the Manchester ship canal has done much business already, and the prospects of its becomimg as successful as its projectors expected seem more than good.

The shipping of the maritime Provinces of Novia Scotia, New Brunswick and Prince Edward Island continues to show an astonishing decrease. During the last ten years the total tonnage has decreased over one-third of the whole, or by 330,985 tons; from 890,810 tons in 1884 to 569,915 in 1893.

Dr. Lucius A. Smith, for the past thirty years prominently identified with naval architecture, and since 1863 connected with the Continental Iron Works of Brooklyn, N. Y., died at his late residence in that city on the 5th inst. As superintendent of the Continental Iron Works he built Ericsson's Monitor. He also superintended the construction of several other vessels for the U. S. Navy, and after the war turned his attention to designing merchant vessels and yachts. He was a member of several engineering societies, and in his character as a man was universally loved and respected.

Mr. F. W. Wheeler, West Bay City ship builder, is figuring on a contract for steel vessels to go to the Atlantic coast, but he says the matter is not yet in shape to warrant the publication of details. If the order is secured, it will cause a substantial increase in the aggregate of tonnage to be built on the lakes this year.

An interesting study of the horse power of the whale has been made by the eminent anatomist, Sir William Turner of the Univ rsity of Edinburgh, Scotland, in conjunction with John Henderson, the well-known Glasgow ship builder. The size and dimensions of a great whale stranded several years ago on the shore at Longriddy furnished the necessary data for a computation of the power necessary to propel it at the rate of twelve miles an hour. This whale measured 80 feet in length, 20 feet across the flanges of the tail, and weighed seventy-four tons. It was calculated that 145 horse power was necessary to attain the speed mentioned.—Exchange.

MARINE REVIEW.

DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

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MR. G. G. HADLEY of Toledo, who is largely interested in Hocking coal mines, seemed very earnest in proposing at the meeting of the Lake Carriers' Association last week that an effort be made to induce coal shippers at Ohio ports to sell fuel to steamers for the same price at which it is sold as cargo coal. He says the shippers can afford to make one price in all cases where the coal is loaded as fuel with no more trouble than is encountered in loading it into the cargo hold. This seems like a good argument, but it has occurred to us that the simplest way of getting at the proposed reduction would be to induce Mr. Hadley, who is at the head of the committee with this end in view, and who is a coal shipper as well as a seller of fuel, to start the ball rolling by cutting the price on fuel to the cargo figure. His competitors will be forced to follow suit.

IT IS certainly not to the credit of the steamboat inspection service of a great country like ours that the local officers of the service, who were entrusted with the duty of investigating the Philadelphia–Albany collision case, should report absolutely nothing as to the cause of the collision, or the drowning of a whole boat-load of men under circumstances, which, as reported, are doubted by almost everybody who has any knowledge of lake navigation.

THE total premiums paid or due to five ship building concerns in this country, on account of increased speed over contract requirements in naval vessels, is $1,290,000. The government should encourage ship builders in all matters pertaining to the construction of the best ships, but the system under which this vast amount of money has been paid out has numerous serious faults, as has repeatedly been shown, and should be abandoned.

IT is not intended to include the Buffalo line boats among the vessels that are expected to enter into the agreement to remain idle 25 per cent. of the time during the coming season. The plan proposed is feasible and can be carried out without the full 90 per cent. of tonnage engaged in the carrying trade. If the agreement is not signed and lived up to, vessel owners must henceforth be charged with a lack of confidence in one another.

ACCORDING to reports from Washington, estimates of the government engineers for river and harbor improvements are to be cut to one-quarter of the original figures, and the entire bill is not to exceed $8,000,000. In view of the present condition of the national treasury the shipping interests will be fortunate if a river and harbor bill of any kind is passed.

VESSEL owners learned last season what it costs to carry freight. Many of them will probably keep their vessels tied up this spring without an agreement.

Demand for the Best Material in Hulls.

Frequent comment has been made of late upon the fact that while the inspection and requirements of the steel plates used in the construction of marine boilers are most severe, and all such material is inspected most carefully by the government inspector, so that nothing but the very best open hearth steel is allowed to be used for this purpose, yet in the construction of the hulls of steel vessels almost any material is allowed to be used, although it is well known that the strain to which this material is subjected (as shown by the experience of the past two seasons) is frequently much greater than is required of the boilers. Of course, some of the classification societies that have of late classed a few of the ships on the lakes, have demanded tests of material to a certain extent, and builders are all more careful than they were in time past, but it would seem that definite steps should be taken by owners and builders of vessels towards securing better material for the construction of hulls. Now that there is no special injury to be done to any of the several plants around the lakes by a discussion of this subject, it should be looked into very carefully by all concerned. It is not the desire to encourage further legislation in a business that is already surrounded by too much supervision of a paternal kind from the government, but unless the owners and builders take up this question themselves they will probably find that delay in the matter will cause them annoyance in the future.

The change from wood to iron, and later to steel vessels, has been a matter of only a few years, and while owners were enabled by their experience to judge of the material and workmanship entering into their wooden vessels in the past, they have little experience to guide them as to what should be used in the construction of steel vessels. It would seem as though it should be necessary to use the very best and strongest material for the hull plates of a vessel, for the same reason that renders it wise to use nothing but the best for boilers, and if open hearth steel is necessary for the latter, it seems just as necessary that equally as good material should be used for the hull plates. Why it is, then, that inferior material, such as Bessemer and Basic steel, should be permitted to be used for this purpose, is a matter that will at least bear careful investigation by the owners as well as the builders. For a long time the much cheaper cost of the inferior grades caused the builders to use Bessemer or Basic steel, but as the prices of the best material have been gradually working down much closer to the cost of the inferior grades, it would seem that both parties in interest can afford to use equally as good material for their hulls as they insist on using and are compelled to use for their boilers. Although there is now more care used in the selection of material than in the past, it is no secret that within the past two years steel plates furnished for the construction of vessels to some of the builders on the lakes, and made from material which has been used for the construction of hulls, have shown most remarkable signs of inferior quality. In one ship yard a plate broke in two on being thrown from a truck, and in another instance two plates, after having been placed in position on the hull, broke in two with comparatively no strain upon them. These plates were made, it is understood, of Basic steel, a quality that is claimed by its manufacturers to be superior to the Bessemer. It is evident that there is room for improvement in steel of this grade, and if acid open hearth steel is the only suitable quality for marine boilers that will pass government inspection, it would seem apparent that builders should use equally as good material for their hulls, and especially in view of the fact that the present cost of such material is within $1 or $2 a ton, at the most, of the price of the inferior material.

In view of this low cost and the great question of safety involved, owners should insist upon having fully as good material for the hulls of their vessels as is required for their boilers, and they should see that the inspection is very severe. Builders can obtain this material without any trouble if owners will insist upon their doing it. We learn that of late several of the lake builders have, for their own reputation as well as at the request of the owners, used open hearth steel for their hulls, for which they paid from $3 to $5 a ton more than the Basic or Bessemer steel could be procured for, and we are informed that the difference in price now is not more than $1 a ton in extreme cases, so that there is very little excuse for using inferior material for any purpose at present.

Illustrated Patent Record.

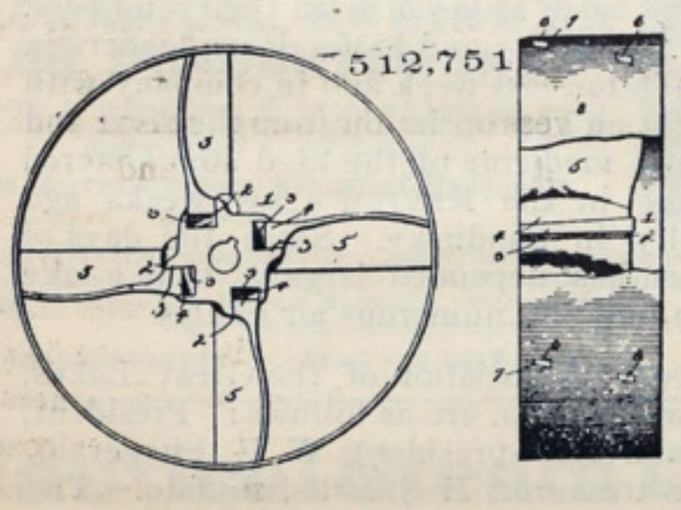
SELECTED ABSTRACTS OF SPECIFICATIONS OF A MARINE NATURE—FROM LATEST PATENT OFFICE REPORTS.

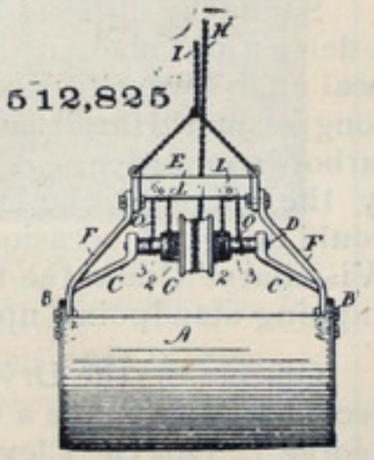
512,751. PROPELLER WHEEL. Mikle Schmaltz, Bay City, Mich., assignor of one-half to William J. Wanless, same place. Filed July 20, 1893. Serial No. 481,047. (No model.)

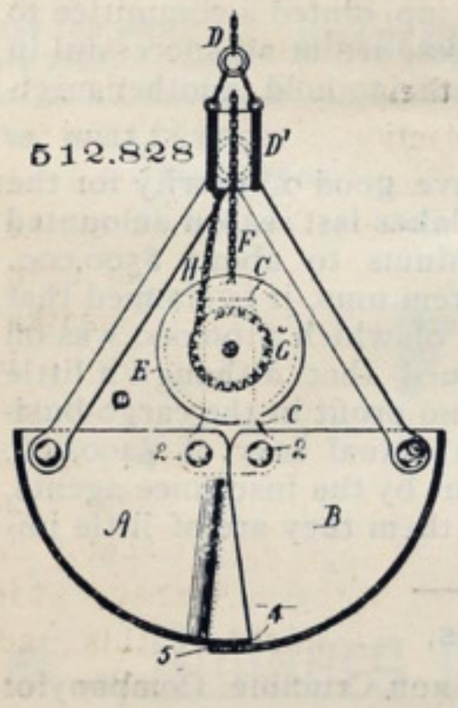
Claim: In a propeller wheel, the combination of a hub provided with spirally disposed ribs or enlargements which are partly cut away to form channels having straight floors, blades fitting at their inner ends in said channels, a rim provided with spaced apertures or perforations, projections integral with the outer ends of the blades fitting in said apertures or perforations and headed upon the outer surface thereof, and tapered wedges or keys fitting in the channels between the inner ends of the blades and the floors of the channels.

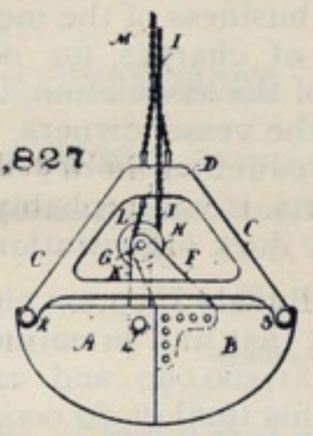
512,825. DREDGING OR EXCAVATING APPARATUS. Charles W. Hunt, West New Brighton, N. Y. Filed May 22, 1893. Serial No. 175,023. (No model.)

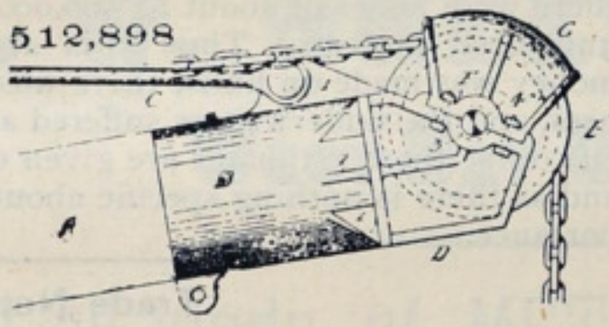
Claim: First, the combination with the scoops or teeth, and the frame and pivotal connections, of three barrels of different sizes and a shaft or axis for the same revolving together, a hoisting chain connected to the largest barrel and by which the barrels are revolved, and a chain extending between the other two barrels and acting to close the apparatus as the barrels are revolved. Second, the combination with the head-block, scoops or teeth and the pivoted connections, of a main shaft, a chain barrel upon such shaft, a hoisting chain











passing around said barrel, differential chain barrels upon the main shaft, chains therewith connected and pulleys upon the head block over which the differential chains pass.

512,827. EXCAVATING OR DREDGING BUCKET. Charles W. Hunt, West New Brighton, N. Y. Filed May 29, 1893. Serial No. 475,932. (No model.)

Claim: First, in an excavating or dredging apparatus, the two-part bucket or grapple having arms upon one part or section extending upwardly and over the other part or section, and pivotal connections between such arms and the other section, the pivots at the upper ends of the arms being at one side of a plane passing vertically between the two sections of the bucket or grapple, in combination with a drum and shaft supporting the drum, such shaft extending between the arms at the respective ends of the bucket and forming or being in line with the pivots at the ends of the arms, and a hoisting chain attached to the drum, the parts being constructed so that such hoisting chain is in a vertical plane passing centrally between the two halves of the bucket or grapple, or nearly so. Second, the segmental buckets A and B, in combination with the frame C and head-block D to which said segmental buckets are pivoted, arms F extending from the segmental bucket B and over the segmental bucket A, the shaft G carried by such arms F, the drum H upon the shaft G, a hoisting chain I passing through the head-block, and links K pivoted at the shaft G and upon the segmental bucket A.

512,828. EXCAVATING BUCKET. Charles W. Hunt, West New Brighton, N. Y. Filed Sept. 21, 1893. Serial No. 486,124. (No model.)

Claim: In an excavating apparatus, the two parts or shells having the edge 5, of the bucket B, below the edge 4 of the bucket A, so that in closing the one edge passes over the other and the one bucket laps upon the other and the edges pass beyond the cutting point.

512,898. BOOM FOR DREDGES. William B. Piess, Stockton, Cal., assignor to the Piess Dredging and Reclamation Company, of Nevada. Filed June 6,1893. Serial No. 476,739. (No model.)

Claim: First, in combination with the boom of a dredger, and with its supporting hog chain or tension rod a loose sleeve fitting the cylindrical end of the boom, a frame forming part of said sleeve, sheaves for the dredger chains journaled in said frame, and a hood or guard for retaining said chains on the sheaves. Second, in combination with the boom of a dredger, a frame or box on the end of the boom, sheaves suported in said frame, a guard or hood, and ribs or flanges projecting from said guard into the space between the sheaves.

Miscellaneous Mention.

Assets of C. P. Willard & Co. of Chicago, assigned, are reported at $100,000 and liabilities $50,000.

Richard P. Joy of Detroit has issued another pamphlet treating of protection to American shipping. It is entitled "Side Lights on the Fithian Free Ship Bill," and is very interesting.

English journals report that the London and Glasgow Engineering and Iron Ship Building Company will build for the Cunard company's Atlantic trade two large twin-screw cargo steamers, that will surpass any vessels of their class as yet constructed.

It is reported from Port Huron that the Jenks Ship Building Company has contracted with the Calumet and Hecla Mining Company to employ the steamers Runnels, Desmond and L. S. Porter in carrying copper from Portage to Black Rock at 95 cents a ton.

Richard D. Mallett of Duluth is one of the incorporators of a company called the Uncle Sam Transportation Company, organized to operate vessels in the fruit trade between ports of Central America and the United States. The projectors say they are preparing to have whaleback steamers built at West Superior.

James J. Hill, president of the Great Northern Railway Company, and E. T. Nichols of New York, secretary and treasurer of the same company, were in Cleveland, Tuesday. They met Mr. F. P. Gordon, who is in charge of details connected with the construction of the Northern line passenger ships.

The 65-foot wooden tug on which the Standard Contracting Company will shortly begin work at the head of the old river bed, Cleveland, will be fitted with the engines and Herreshoff water tube boiler recently removed from the yacht Nautilus. The contracting company has offices in the Wade building, Cleveland, and has for some time past been engaged in dock work, bridge construction and general contracting. The tug will be used on this class of work.

Officers of the Richardson Transportation Company, controlling the steamer Roumania and consort Barlum, are: President, H. J. Webb; vice-president, H. C. Ellison; secretary, treasurer and general manager, W. C. Richardson. In addition to the officers named, F. W. Leek, H. D. Goulder, Capt. Thomas Jones and John Thomson are members of the board of directors.

At the annual meeting of the stockholders of the Clyde Iron Company in Duluth, Wednesday, George D. Kirkham, formerly secretary and superintendent of the Vessel Owners' Towing Company of Chicago, was elected secretary. Mr. Kirkham has taken an interest in the Clyde Iron Company and will manage its ship chandlery department. Mr. R. A. Webster, who has had long experience as a marine engineer, remains in charge of the company's machinery department.

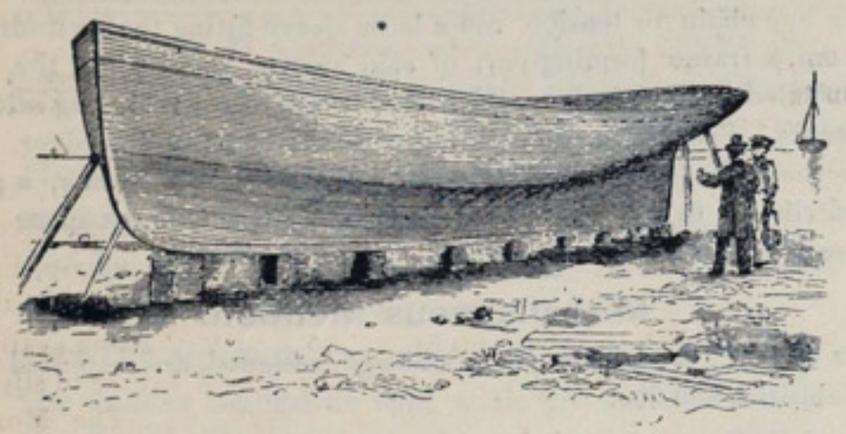
After securing assurance of some measure of support from the vessel owners in Detroit last week for the publication of the old insurance register, the general agents of the insurance companies began the usual dispute as to where the register shall be published. The trouble is due mainly to considerable feeling between Smith, Davis & Co. and C. A. Macdonald & Co. Macdonald will not agree to the office of the register being located in Buffalo, and at last accounts Smith, Davis & Co. would have it nowhere else.

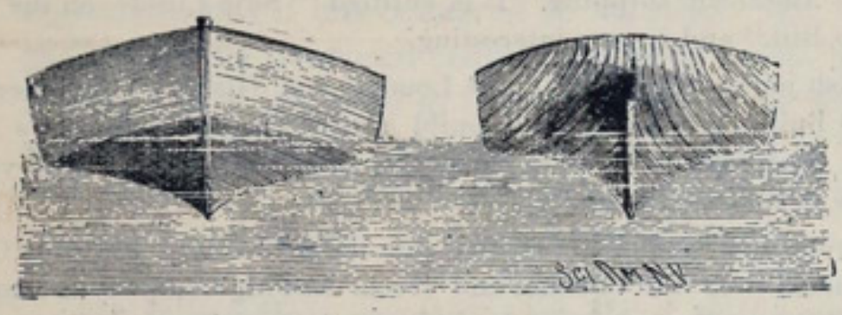
Transfers of Vessel Property.

The number of vessels placed for sale with brokers this winter is not greatly in excess of the offerings in previous years, for the very good reason that owners have little hope of selling, excepting at a great sacrifice. A few unimportant sales have been made at very low figures, and among them are: Steam—T. W. Snook, J. V. O'Brien of Oscoda, Mich., to Baker Bros. of Detroit, $2,500; John E. Hall, Capt. White and others of Detroit to Capt. T. Donovan and John Donovan of Oswego, $18,000. Sail—Shawnee, Thomas Adams of Detroit to J. W. Westcott of Detroit and M. P. Scott of Port Huron, $8,000. The Owen fleet of Detroit, consisting of the J. E. Owen and consorts Michigan and Nicholson, and the steamer John Owen are offered for sale.

Improvement of Vessels' Hulls.

The illustration represents an improvement in the hulls of vessels designed to afford the maximum of speed and safety, while the construction is such that drift to leeward will be in a great measure avoided. The invention has been patented in Canada and Great Britain, as well as in this country, by P. O'Brien of St. Patrick's Deanery, St. John's, Newfoundland. The bottom of the vessel is curved in convex form from the stem to the stern, and has a concave face from the keel to the





sharp-edged bilge, while from the bilge to the top of the hull the sides are curved, presenting an outer convexed surface at the stern. The small figures represent bow and stern views. In every case where a cross section is taken through the bilge the sides and the bottom of the hull meet at an obtuse angle, and the outward inclination of the sides preferably increases from the ends of the hull. The steering qualities of vessels built after this plan are, it is claimed, greatly improved, especially in high winds, which throw the hull over upon its side, as the bilge sections then serve as a side keel to hold the vessel to its course.—Scientific American.

Around the Lakes.

M. A. Bradley has gone south on a pleasure trip.

Lumber dock laborers of Cleveland have again refused to return to the contract system of unloading vessels.

Through an error in copying the list of ten vice-presidents elected at the annual meeting of the Lake Carriers' Association, the name of Mr. A. B. Wolvin of Duluth was omitted.

Leatham & Smith of Sturgeon Bay have begun suit against the owners of the steel steamer Arthur Orr for the loss of the steamer Smith in collision with the Orr near Racine last fall.

Curtis & Brainard's steamer Santa Maria, recently built at Marine City, has a gross tonnage, customs measurement, of 982.79 tons. The net tonnage is 790.89 and the official number, 116,606.

Capt. Alex. R. Sinclair, whose last command was the steamer Simon Langell, has formed a partnership with Mitchell & Co. of Cleveland and will open up an office in Ashland to do a general brokerage and insurance business.

Frank W. Hawley of Albany, N. Y., who had charge of the canal electric experiments near Rochester in December last, will ask permission of the state superintendent of public works to operate on the state waterways next season a boat of special design which he proposes to propel with a storage battery.

The three steamers and a schooner, wooden freight vessels, under construction at James Davidson's ship yard, West Bay City, Mich., will all be in commission early in the spring. The last of these vessels to be put down is numbered sixty-four. They will have a combined capacity of about 9,000 tons.

Through a disagreement with Engineer Overman, who was removed from the Cleveland office of the army corps of engineers, Mr. J. R. Irwin of Fairport is forced to go before congress to secure the passage of an enabling act, in order to obtain payment for dredging done at Fairport two years ago. It is the general opinion on the lakes that the war department would do well to assist in settling legitimate claims of this kind, as well as any other matters that may be in dispute and in which Engineer Overman has had a hand.

It is very probable that the six steel steamers of the Menominee Transportation Company will run between Duluth and Lake Erie ports next season, carrying the ore of the Oliver mine, Missabe range. M. A. Hanna & Co. are sales agents for this mine and also control the Menominee boats. The Mutual line steamers, controlled within the same firm, will continue to run to Escanaba.

Capt. Robert McDowell, who has sailed the steamer Aurora for several seasons, will command the big steamer Selwyn Eddy next season. Capt. Marion Tinney will not return to the command of the steamer Frank L. Vance in the spring; neither will Capt. Patrick O'Neill be returned to the steamer W. H. Wolf. Their successors have been selected but their names are withheld by the owners of the steamers.

Capt. W. H. Campau, who is slated to sail the big Northern Line passenger ship North West was at the Cadillac in Detroit during one of the sessions of the Lake Carriers' Association last week. Campau is a good story teller and is always interesting in conversation. Upon a friend offering congratulations upon his new appointment he answered that he had received congratulations on that score from everybody excepting John Gordon.

Sandusky citizens have been aroused from their slumbers. A delegation made up of the mayor and half a dozen leaders in local affairs went to Washington last week and in company with Congressman Harter sought an appropriation from the river and harbor committee. A little medicine of the kind administered by the "Man on the Dock" in the REVIEW a few weeks ago would do good occasionally in Sandusky. Since the days of "Visionary" Crane the town has depended largely, from a lake shipping standpoint, upon building numerous air castles.

Officers of the Dry Dock Association of the Great Lakes, elected at Milwaukee a few days ago, are as follows: President, George L. Quayle, Cleveland; vice-president, W. E. Fitzgerald, Milwaukee; secretary and treasurer, H. J. Mills, Buffalo. The principal business of the meeting was the adoption of last year's schedule of charges for docking vessels. The next regular meeting of the association, in January, 1895 will be held in Buffalo. If the vessel owners, who have appointed a committee to secure a reduction in dry dock charges, are at all successful in their efforts, it will probably be necessary to hold another meet- of the dry dock organization.

The Buffalo Express claims to have good authority for the statement that hull premiums on the lakes last season amounted to about $1,500,000 and cargo premiums to about $500,000. Against this total of $2,000,000 in premiums, it is claimed that there were losses of about $2,500,000, of which $100,000 was on uninsured interests. Thus it is argued that although a little money was made on hulls, there was no profit in the cargo business, and the underwriters suffered an actual loss of $400,000. Of course these estimates are given out by the insurance agents, and as there is nothing specific about them they are of little importance.

Trade Notes.

About a year ago the Joseph Dixon Crucible Company of Jersey City, issued a pamphlet on lubricating graphite. It embodied an elaborate scientific opinion by Prof. R. H. Thurston on the value of graphite as a lubricant, and much interesting information on the subject from practical men. The pamphlet has had a large circulation, and the company has been enabled to obtain from well known men a vast amount of additional knowledge on the uses of graphite. Another pamphlet, twice the size of the former, will be issued early in February, and a copy will be sent free of charge to all interested in the subject of friction and lubrication.

On Jan. 1, 1894, sixty eight well known ships, including representative vessels of the Cunard, White Star and American lines, were fitted with Serve's ribbed steel boiler tubes. It would seem that lake builders and owners are in some cases a little backward in matters of this kind representing advanced practice. The experimental period with these tubes has passed. C. W. Whitney of Nos. 81 and 83 Fulton street, New York, the agent in this country for Serve's tubes, is also agent for the Ellis & Eaves' patent suction draft, which has been applied to the new American line steamer Southwark, and the operation of which will be watched with interest.

A Frenchman's Letter.

Here is a copy of a letter received a few days ago by a Cleveland vessel owner from a captain who sailed one of his barges last season :

THE ORIGINAL.

DEAR SIR. i riet flou ling for ask i' you find fould Whet the Book i Woud lack to no i am goun to scoll des Winter for lear to ried and riet i am doung Well if you have bout for me tou sail in the spring i Will bie glad to have one if i sout you last somaur i don the best i could dou i lack to hera from you excuse my Hand Writing. Yours,

A TRANSLATION.

DEAR SIR: I write a few lines to ask if you found fault with the book (meaning last season's log book.) I would like to know, as I am going to school this winter, and I am learning to read and write. I am doing well. If you have a boat for me to sail in the spring I will be glad to tak it, if I suited you last summer. I did the best I could do. I would like to hear from you. Excuse my hand writing. Yours,

It is probably unnecessary to say that the writer of this letter possesses some qualities as a seaman that are of more advantage to him than his ability to write letters that can be read by an American of ordinary intelligence. If writing in his own language he would undoubtedly do better. His willingness to learn to "reid and reite" is at least commendable.

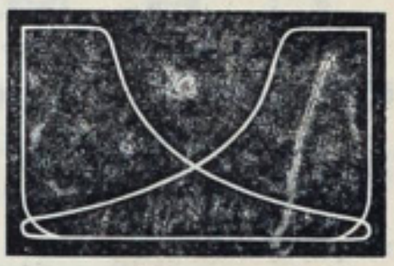
New Officers Among the Engineers.

Division No. 85, Thunder Bay, Mich.: Past president, Thad Kneale; president, Arthur J. Irwin; vice-president, John Maher; recording and corresponding secretary, Alfred W. Smith; financial secretary, Robert R. Grant; treasurer, David Thompson; chaplain, Ira Bassett; conductor, Robert Urie; doorkeeper, H. Carter; trustees, Ira Bassett, Robert R. Grant, David Thompson.

Division No. 4, Chicago, Ill.: President, Thomas F. Dowd; vice-president, John Kiefs; recording secretary, Jas. McCauley; corresponding secretary, John McElligott; financial secretary, D. W. Wise; treasurer, James Donnelly; conductor, Wm. Leonard; doorkeeper, Patrick Lee; chaplain, G. T. Galavan; trustees, G. T. Galavan, Geo. VanAvary, J. Doyle; representatives to the convention, T. F. Dowd, Michael Conley.

Another new cruiser, the Montgomery, has won honors for her builders, the Columbian Iron Works of Baltimore, and will be awarded premiums amounting to at least $175,000 and probably $250,000. On her trial trip, Friday, over a course of 36 nautical miles on Long Island sound, she made the extraordinary speed as estimated of 19 knots per hour with the tide against her going out and in her favor returning, and subjecting these figures to slight correction for a tidal change which are likely to be in her favor. The Montgomery is fitted with Blake pumps for main and auxiliary boiler feeding, fire, bilge and water service.

MAKE YOURSELF A
MECHANICAL ENGINEER OR DRAUGHTSMAN;



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The Correspondence School of Mechanics,
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The course embraces Arithmetic, Algebra, Geometry, Trigonometry, Elementary Mechanics, Hydromechanics, Pneumatics, Heat, Mechanical Drawing, Steam and Steam Engines, Strength of Materials, Applied Mechanics, Boilers, Machine Designs, Electricity, etc. To begin, students need only know how to read and write.

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STEAMER **JOSEPH L. HURD,**
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STEAMER H. E. RUNNELS, capacity 800 thousand on 12 feet draft.
STEAMER DESMOND, capacity 450 thousand on 10 feet draft.
Also, WRECK OF S. C. CLARK, including engine and boiler. We would rebuild same at reasonable terms.
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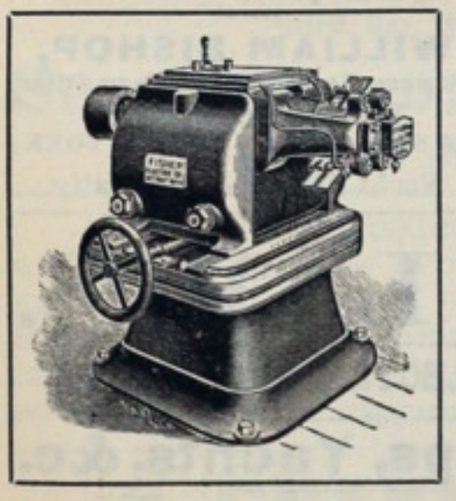
WEST BAY CITY, MICH.
Builders of all kinds of METAL AND WOODEN SHIPS.



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Our DREDGE and CRANE CHAINS are made of IRON ROLLED SPECIALLY for that purpose. Send for Price List

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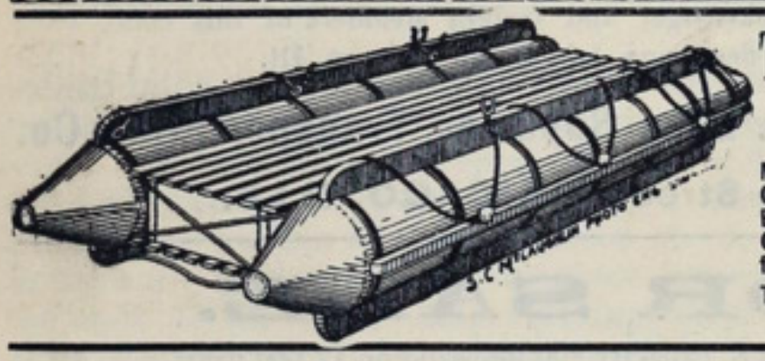

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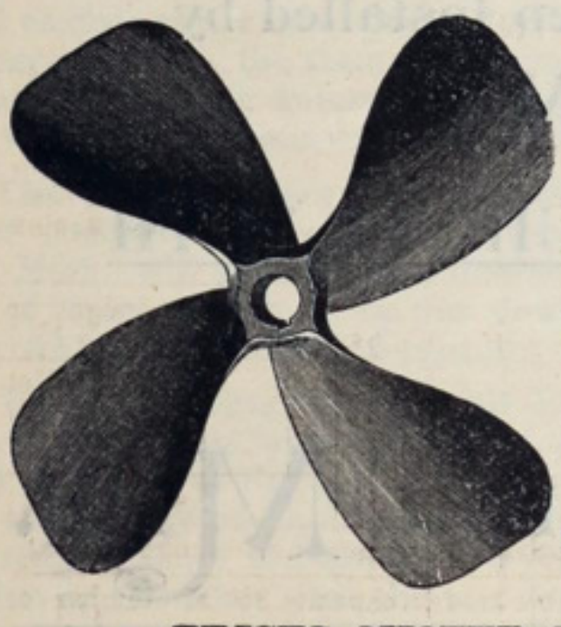

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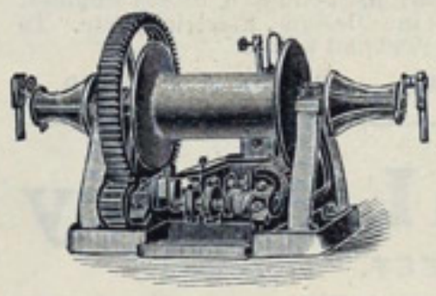

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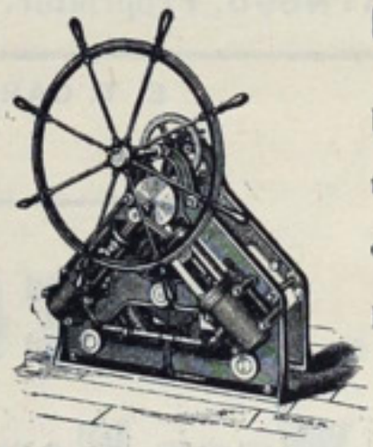

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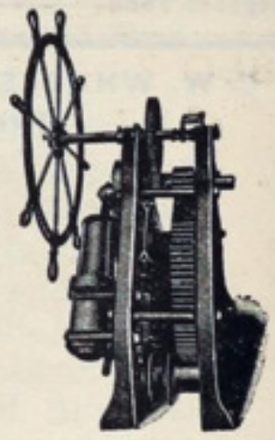

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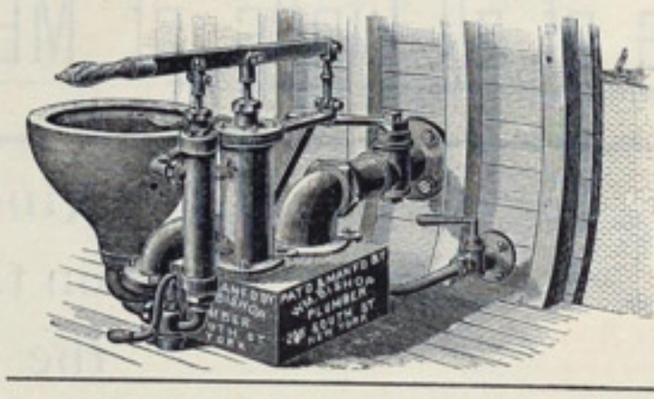

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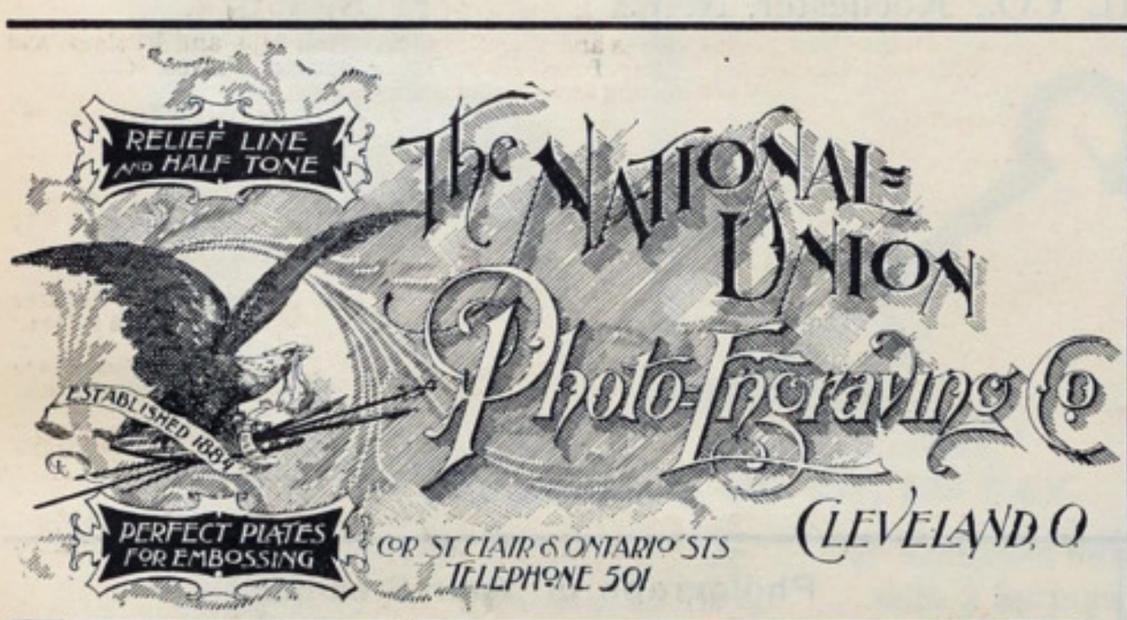

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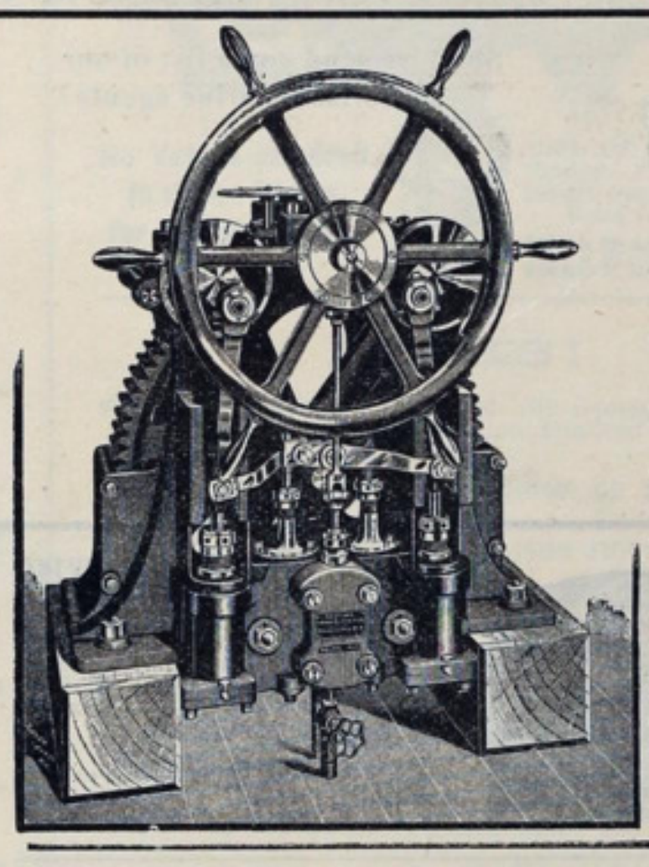

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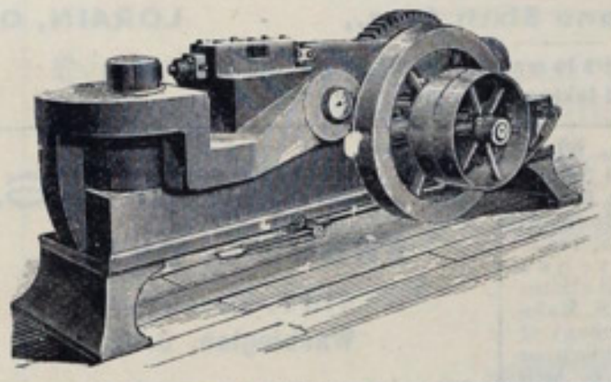

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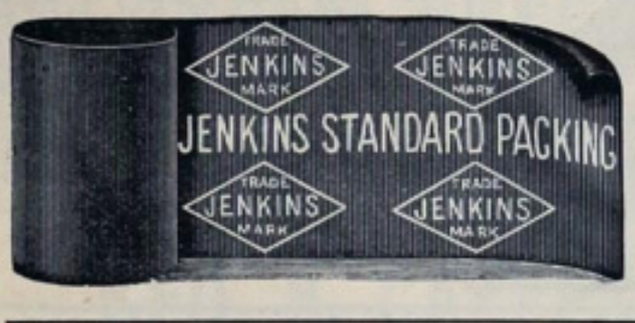

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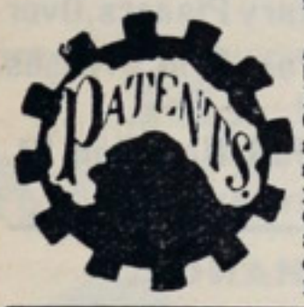

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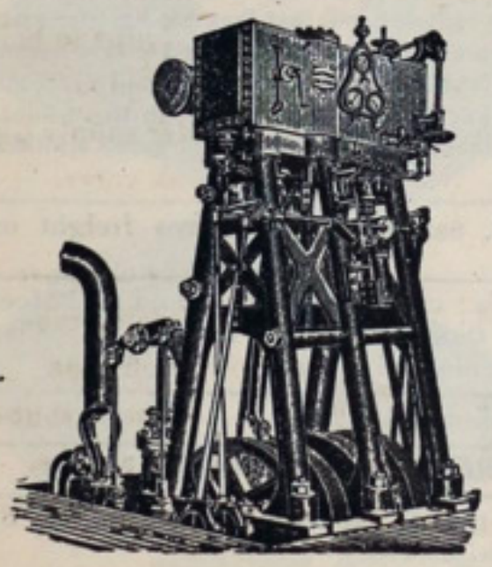

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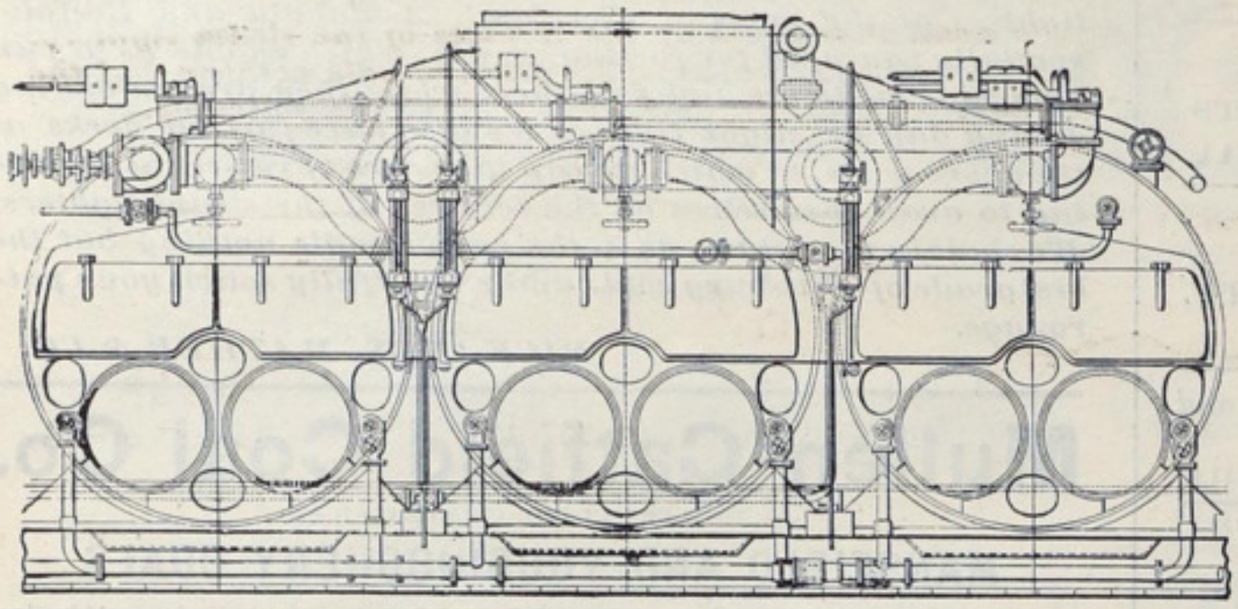

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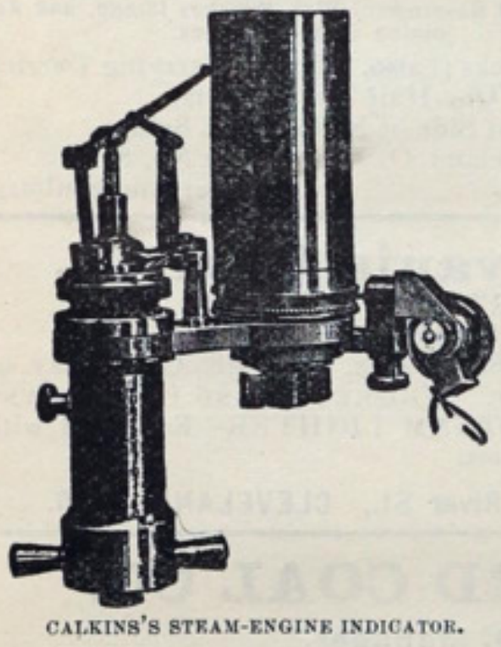

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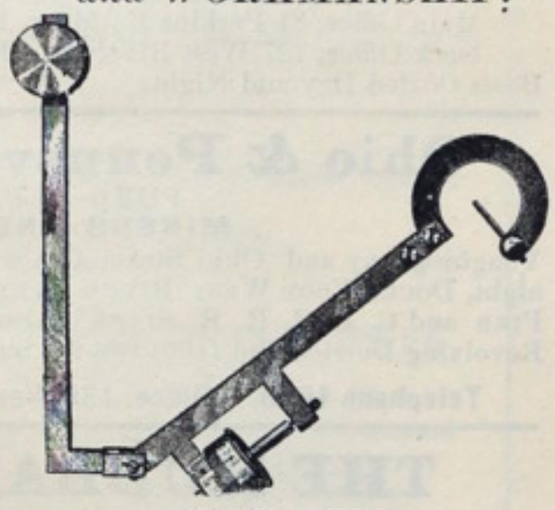

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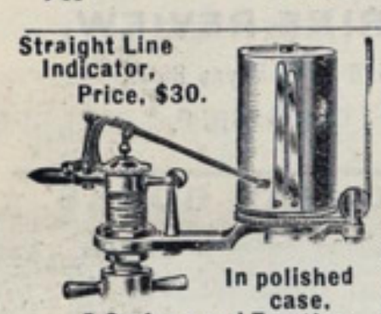

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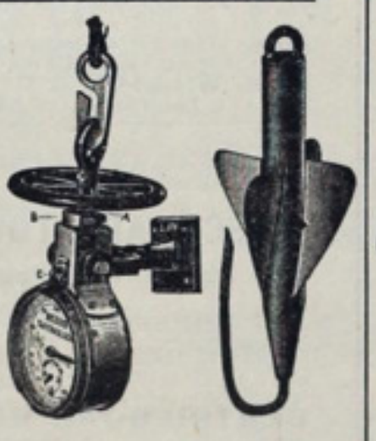

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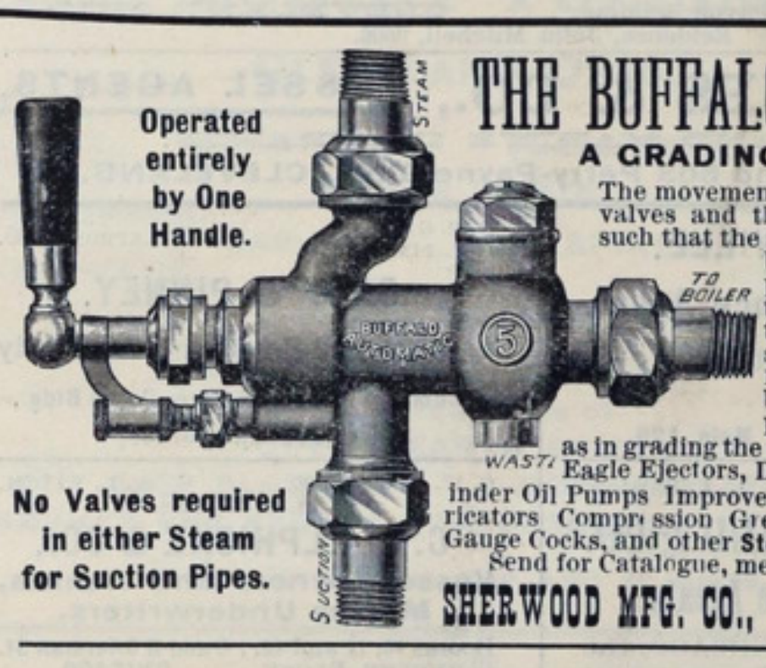

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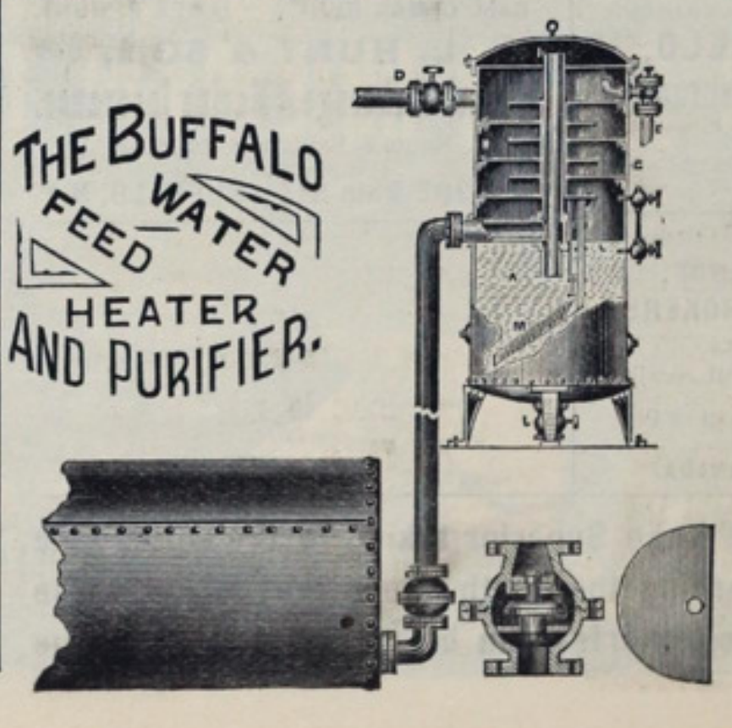

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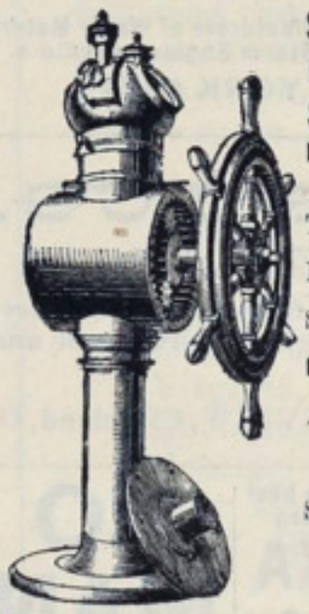

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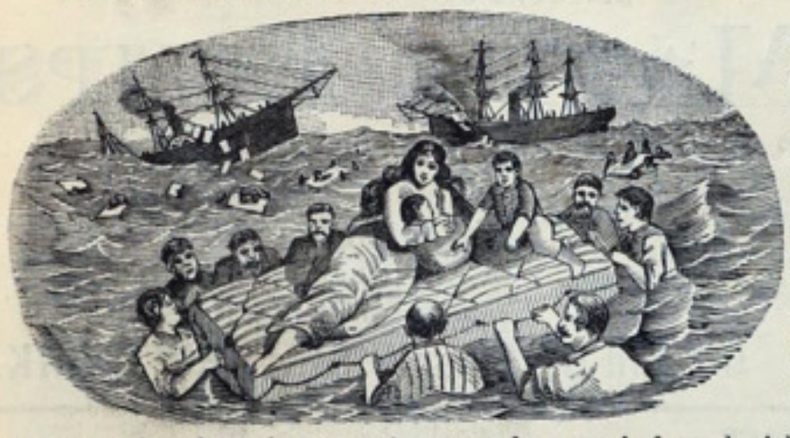

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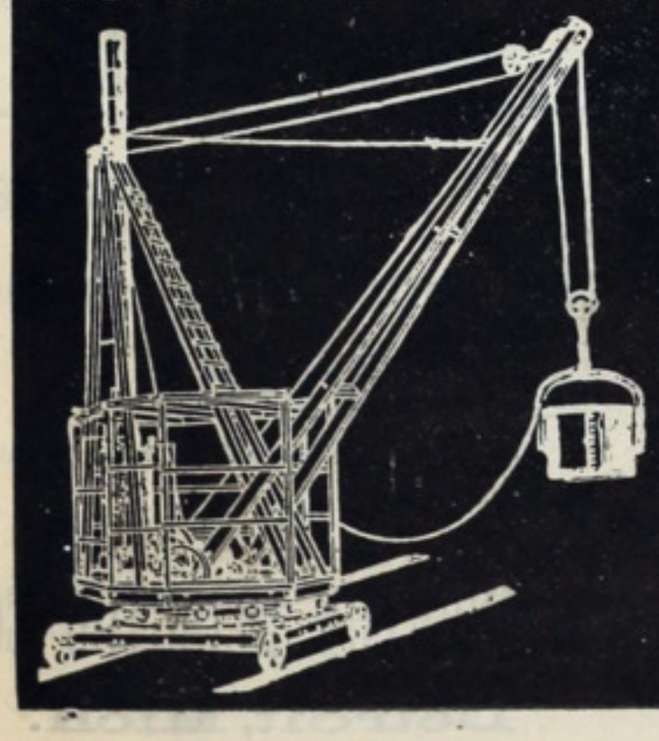

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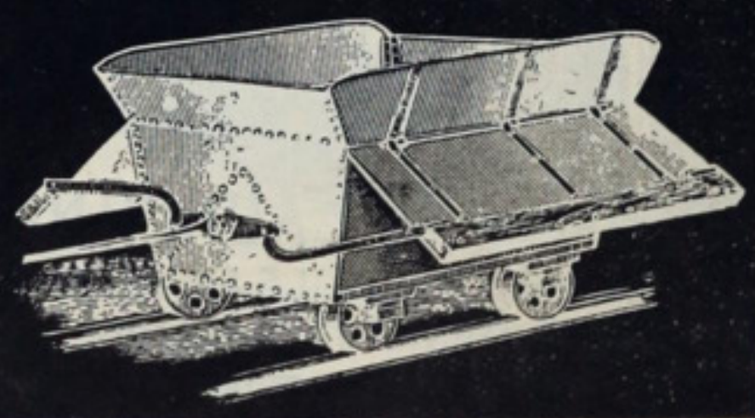

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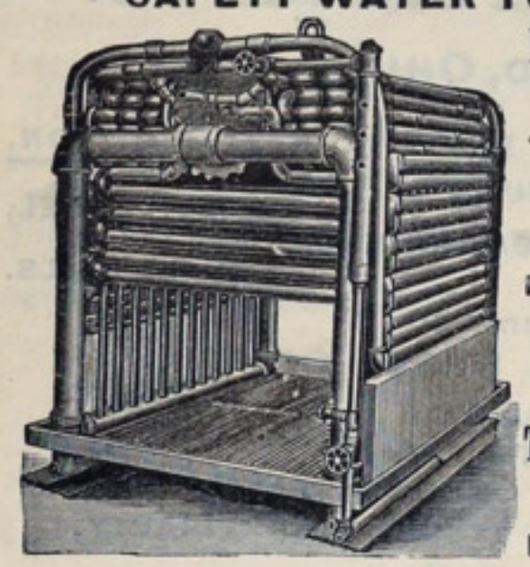

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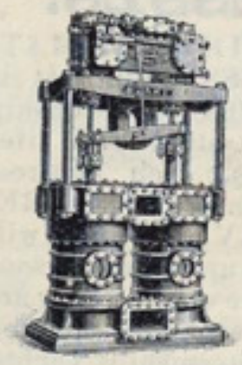

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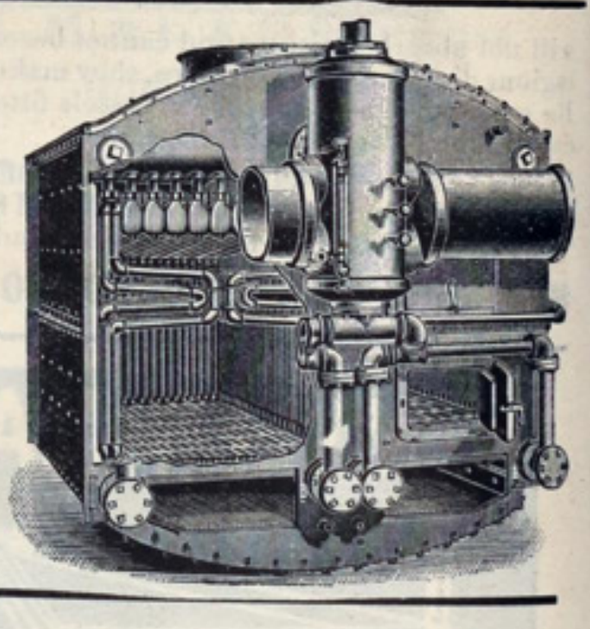

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